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**Huang**

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(54) **JOINT FOR EXPANSIBLE HOST**  
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**F16L 35/00** (2006.01)

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CPC ..... **F16L 33/224** (2013.01); **F16L 35/00**  
(2013.01)

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F16L 15/002; F16L 15/008  
USPC ..... 285/247, 249  
See application file for complete search history.

(56) **References Cited**  
**U.S. PATENT DOCUMENTS**

418,906 A \* 1/1890 Bosworth ..... F16L 33/224  
285/249  
2,464,416 A \* 3/1949 Raybould ..... F16L 33/224  
285/249  
4,032,177 A \* 6/1977 Anderson ..... F16L 33/224  
285/24

4,162,092 A \* 7/1979 Hayes ..... F16L 33/224  
285/148.18  
4,427,219 A \* 1/1984 Madej ..... F16L 47/04  
285/249  
4,736,969 A \* 4/1988 Fouts ..... F16L 33/223  
285/245  
5,332,269 A \* 7/1994 Homm ..... B25B 27/10  
285/249  
5,797,633 A \* 8/1998 Katzer ..... F16L 33/222  
285/243  
6,347,729 B1 \* 2/2002 Spriegel ..... F16L 33/223  
222/409  
2004/0217589 A1 \* 11/2004 Mittersteiner ..... F16L 33/225  
285/255  
2011/0163530 A1 \* 7/2011 Shih ..... F16L 33/224  
285/24  
2013/0087205 A1 \* 4/2013 Berardi ..... F16L 11/00  
137/1

#### FOREIGN PATENT DOCUMENTS

GB 430356 A \* 6/1935 ..... F16L 33/2073  
GB 959100 A \* 5/1964 ..... F16L 33/224

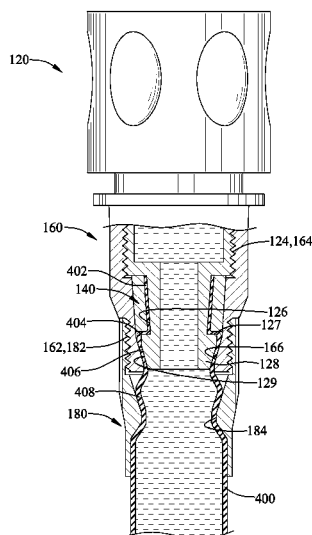
\* cited by examiner

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#### (57) **ABSTRACT**

A joint includes a cylinder, a C-clip and a ring. The cylinder includes a thread and a nozzle. The nozzle includes a neck and a head. The head includes a rear face and a front face. The C-clip includes a front end and placed on a first section of an expansible hose. Thus, a second section of the expansible hose is placed between the front end of the C-clip and the rear face of the head. Moreover, a fold between the first and second sections of the expansible hose is stuck between the nozzle and the C-clip. The ring includes a thread and a frusto-conical face. The thread of the ring is engaged with the thread of the cylinder. The frusto-conical face of the ring is located near the frusto-conical external face of the neck to force the C-clip to press the first section of the expansible hose on the neck.

**7 Claims, 7 Drawing Sheets**



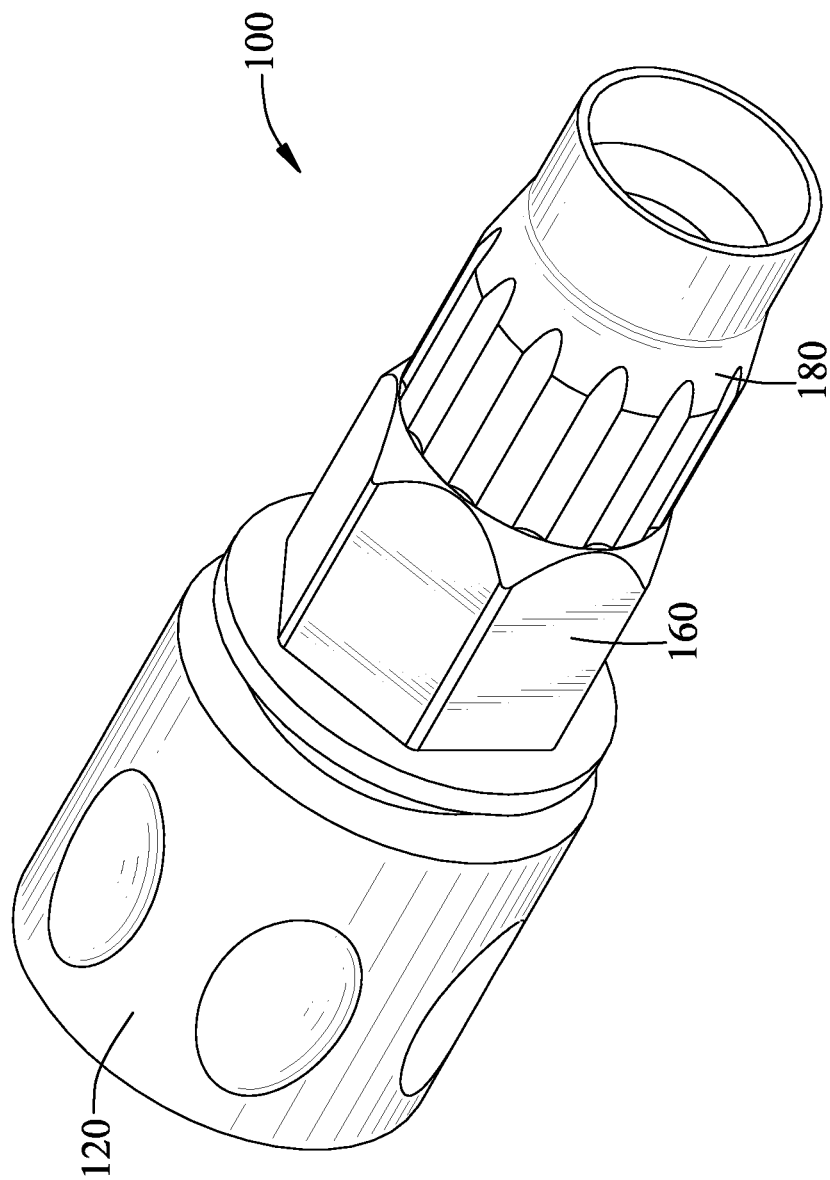


FIG. 1

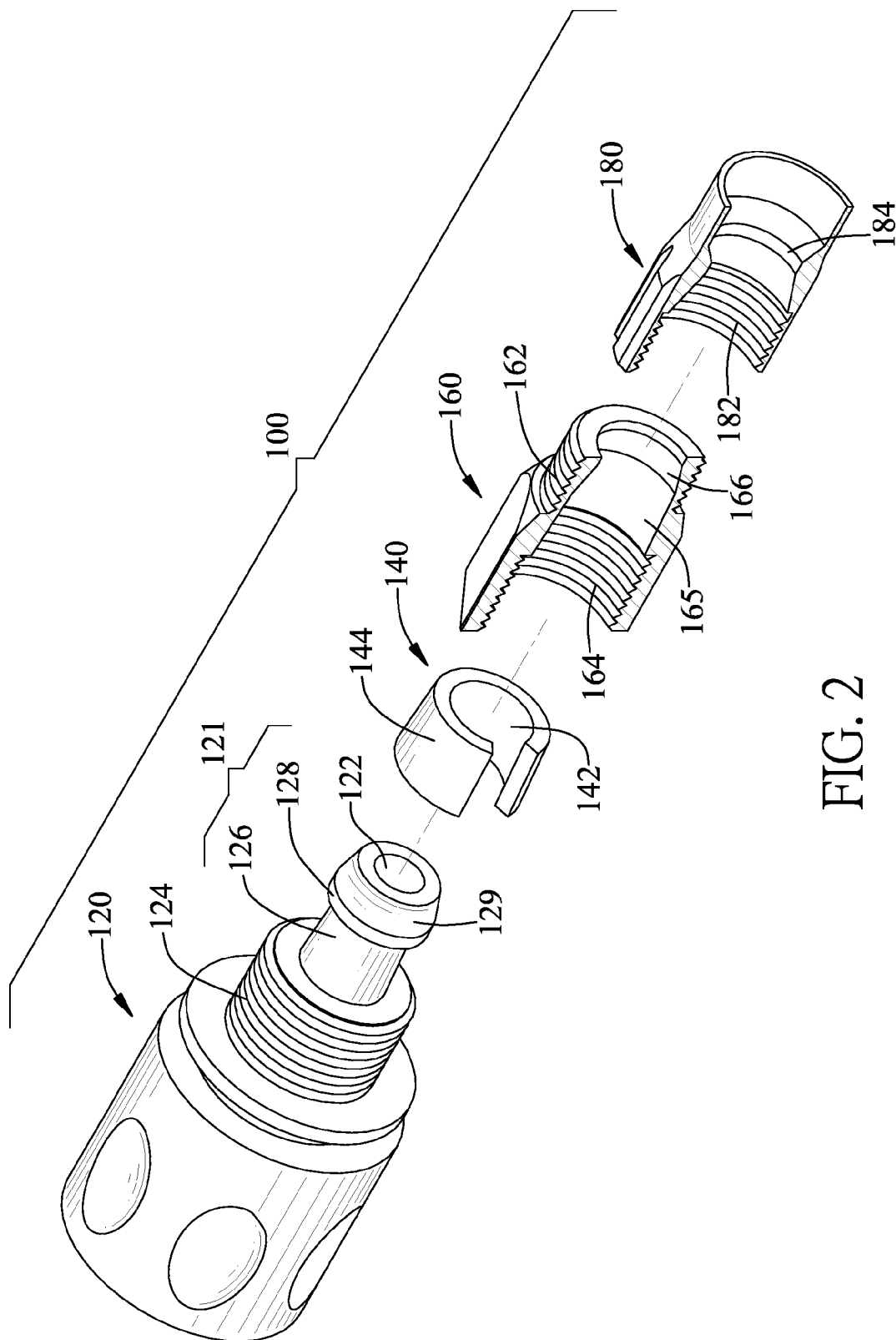


FIG. 2

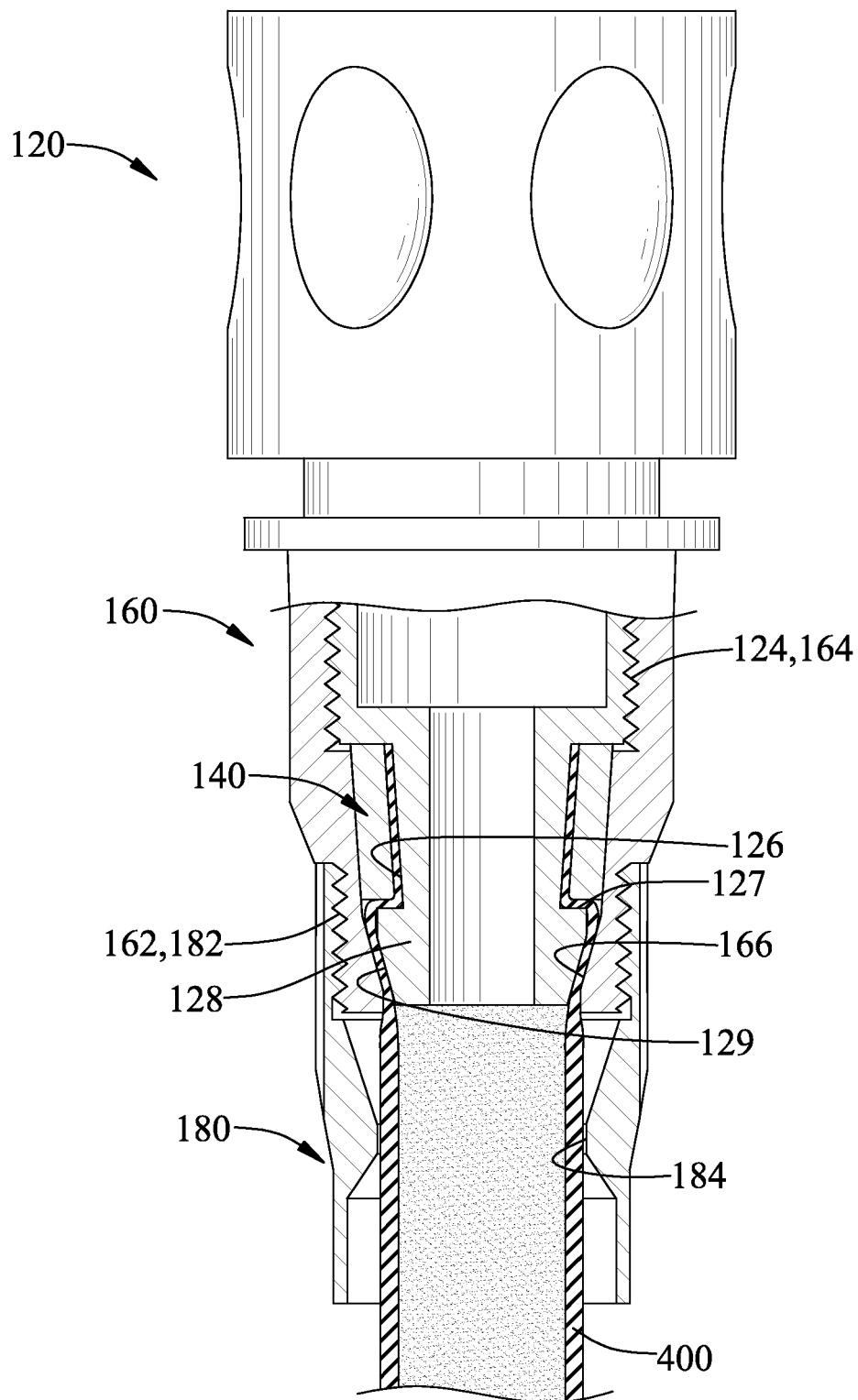


FIG. 3

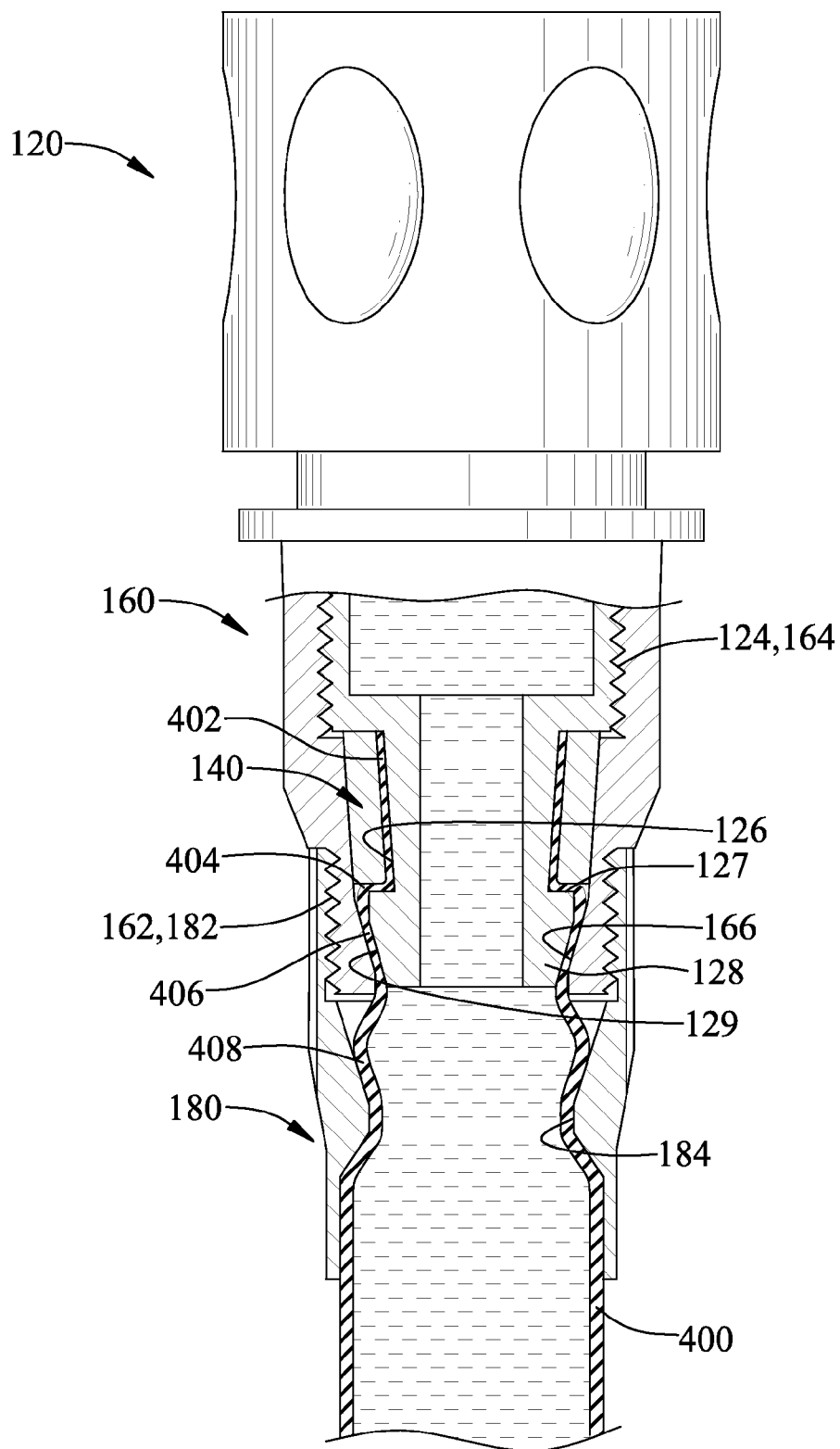


FIG. 4

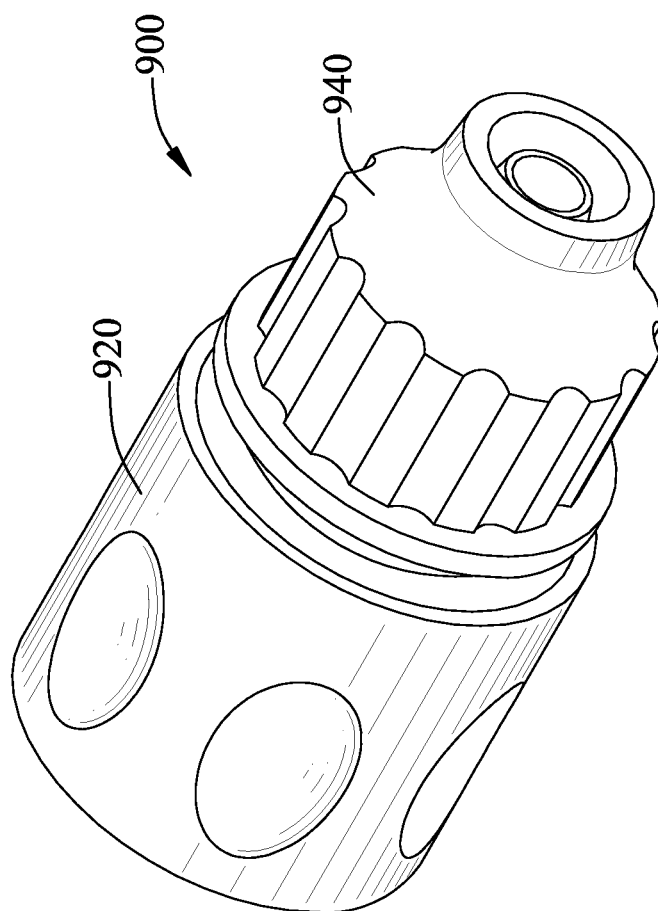


FIG. 5  
PRIOR ART

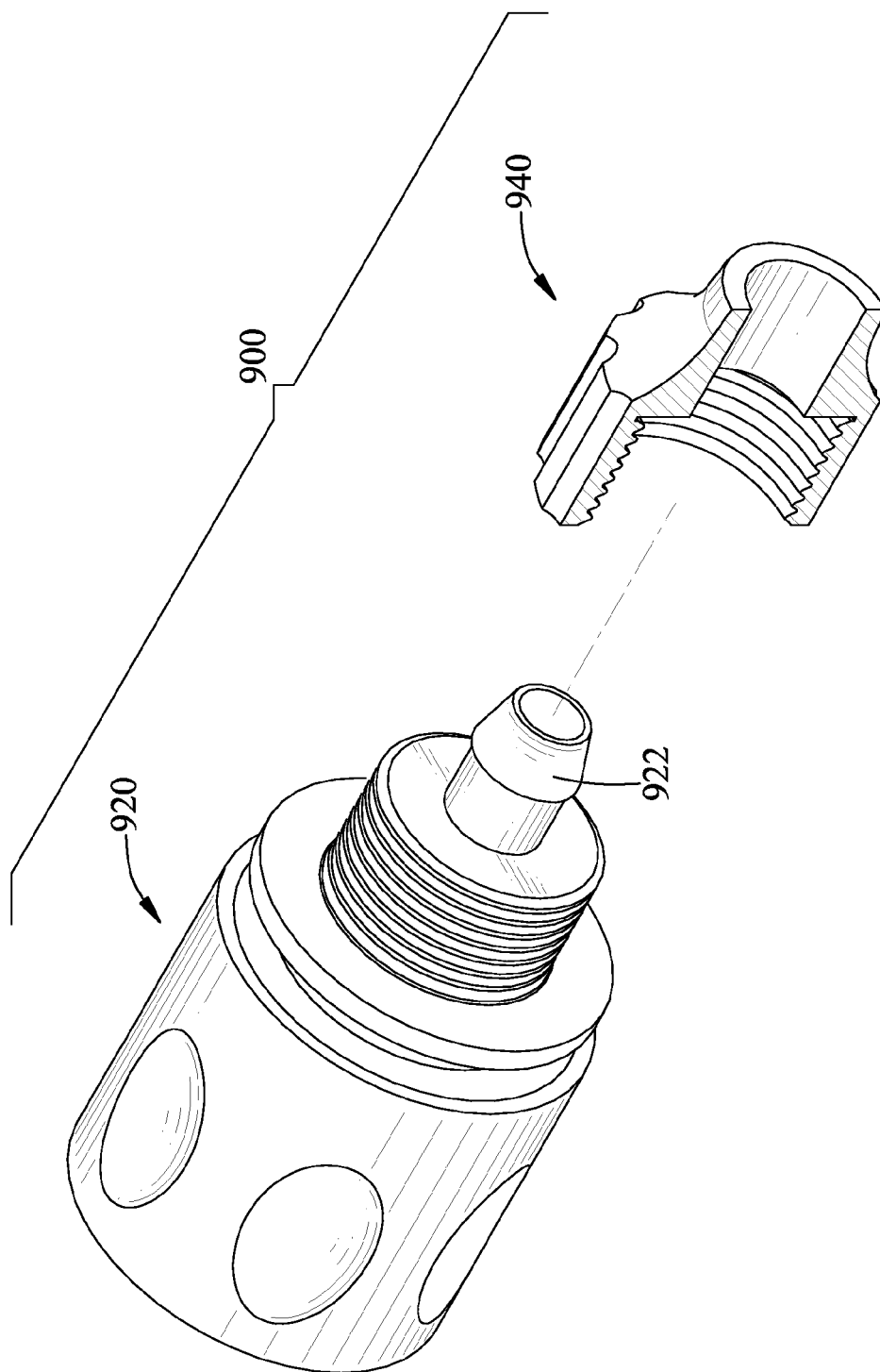


FIG. 6  
PRIOR ART

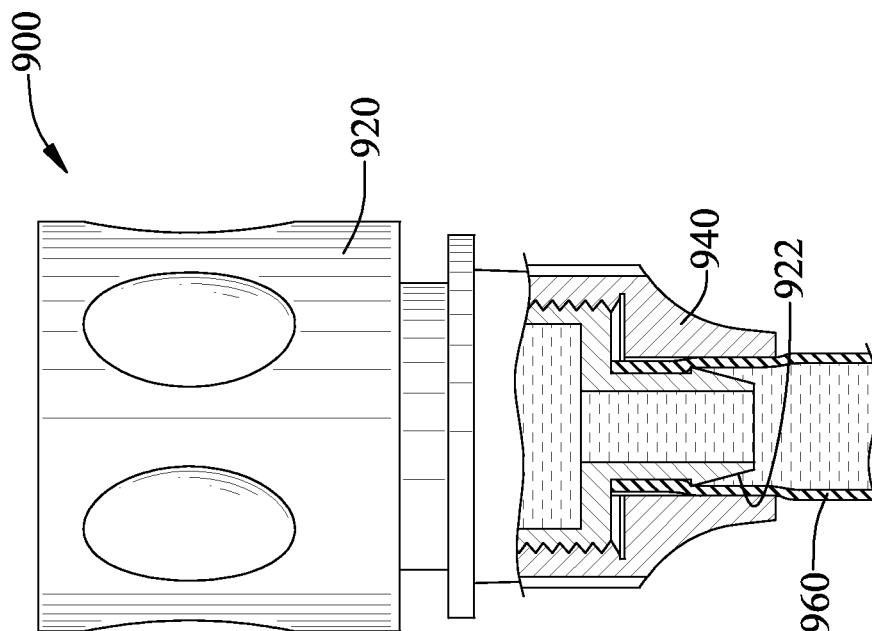


FIG. 8  
PRIOR ART

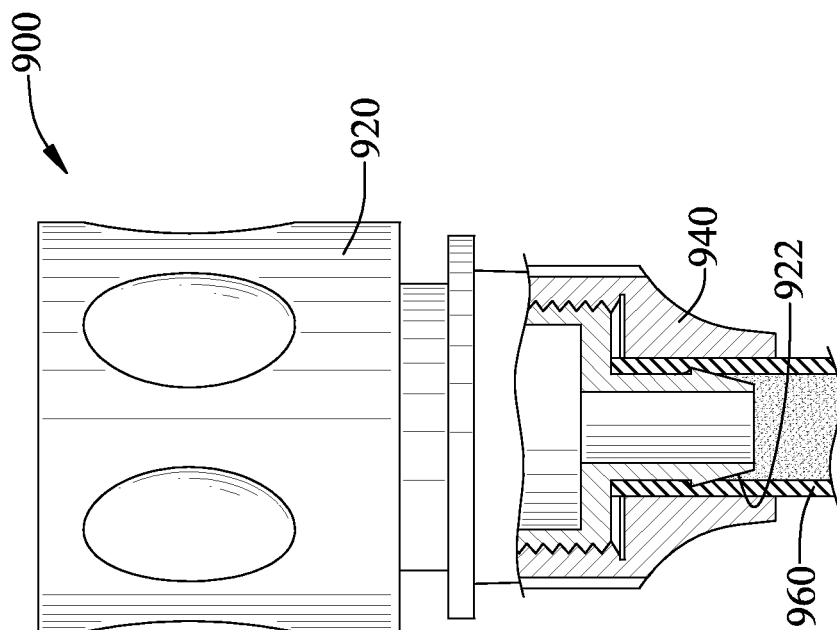


FIG. 7  
PRIOR ART



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## JOINT FOR EXPANSIBLE HOST

## BACKGROUND OF INVENTION

## 1. Field of Invention

The present invention relates to an expansible hose and, more particularly, to a joint for an expansible hose.

## 2. Related Prior Art

Referring to FIGS. 5 to 8, a conventional joint 900 includes a cylinder 920 and a ring 940. The cylinder 920 includes a nozzle 922 that is shaped like a mushroom. In operation, the cylinder 920 is connected to a faucet. An expansible hose 960 is inserted through the ring 940. The nozzle 922 is inserted in the expansible hose 960. A thread formed on an internal side of the ring 940 is engaged with a thread formed on an external side of the cylinder 920 so that the ring 940 is connected to the cylinder 920. Two things are expected. At first, the expansible hose 960 is expected to be firmly joined to the joint 900.

Secondly, there is expected to be no leak. However, the joint 900 does not come up to the expectations. The gap between the ring 940 and the nozzle 922 is constant while the thickness of the expansible hose 960 is reduced as the length and diameter of the expansible hose 960 are increased in operation. Hence, there is leak. Moreover, the expansible hose 960 could easily be detached from the joint 900.

The present invention is therefore intended to obviate or at least alleviate the problems encountered in the prior art.

## SUMMARY OF INVENTION

It is the primary objective of the present invention to provide a reliable joint for an expansible hose.

To achieve the foregoing objective, the joint includes a cylinder, a C-clip and a ring. The cylinder includes a thread and a nozzle. The nozzle includes a neck and a head. The head includes a rear face and a front face. The C-clip includes a front end and placed on a first section of an expansible hose. Thus, a second section of the expansible hose is placed between the front end of the C-clip and the rear face of the head. Moreover, a fold between the first and second sections of the expansible hose is stuck between the nozzle and the C-clip. The ring includes a thread and a frusto-conical face. The thread of the ring is engaged with the thread of the cylinder. The frusto-conical face of the ring contacts the frusto-conical external face of the neck to force the C-clip to press the first section of the expansible hose on the neck.

Other objectives, advantages and features of the present invention will be apparent from the following description referring to the attached drawings.

## BRIEF DESCRIPTION OF DRAWINGS

The present invention will be described via detailed illustration of the preferred embodiment versus the prior art referring to the drawings wherein:

FIG. 1 is a perspective view of a joint according to the preferred embodiment of the present invention;

FIG. 2 is an exploded view of the joint shown in FIG. 1;

FIG. 3 is a cross-sectional view of the joint shown in FIG. 1 and an expansible hose;

FIG. 4 is a cross-sectional view of the joint and the expansible hose in another position than shown in FIG. 13;

FIG. 5 is a perspective view of a conventional joint;

FIG. 6 is an exploded view of the joint shown in FIG. 5;

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FIG. 7 is a cross-sectional view of the joint shown in FIG. 5 and an expansible hose; and

FIG. 8 is a cross-sectional view of the joint and the expansible hose in another position than shown in FIG. 7.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, there is a joint 100 according to the preferred embodiment of the present invention. The joint 100 includes a cylinder 120, a C-clip 140 and two rings 160 and 180. The cylinder 120 includes a channel 122 through which water can run. On an external side, the cylinder 120 includes a thread 124 and a nozzle 121. The nozzle 121 includes a neck 126 and a head 128 with a diameter larger than that of the neck 126. The neck 126 includes a frusto-conical external face that shrinks toward the head 128. The head 128 includes a planar rear face 127 and a frusto-conical front face 129. There is a sharp angle between the planar rear face 127 of the head 128 and the frusto-conical external face of the neck 126. The frusto-conical front face 129 of the head 128 shrinks as it extends from the neck 126.

The C-clip 140 is an elastic element. The C-clip 140 is formed with a frusto-conical internal face 142 and a frusto-conical external face 144. The frusto-conical internal face 142 of the C-clip 140 is shaped in compliance with the frusto-conical external face of the neck 126.

On an internal face, the first ring 160 includes a thread 164 and two frusto-conical faces 165 and 166. The first frusto-conical face 165 is located between the second frusto-conical face 166 and the thread 164 along an axis of the first ring 160. The thread 164 is shaped and sized in compliance with the thread 124. The frusto-conical face 166 is shaped in compliance with the frusto-conical front face 129 of the head 128. On an external face, the first ring 160 is formed with a thread 162.

On an internal face, the second ring 180 is formed with a thread 182 and a frusto-conical face 184. The thread 182 is shaped and sized in compliance with the thread 162. The frusto-conical face 184 shrinks as it extends from the thread 182.

Referring to FIG. 3, an expansible hose 400 is inserted through the second ring 180 and the first ring 160. The nozzle 121 is inserted in the expansible hose 400.

The C-clip 140 is placed on a first section 402 of the expansible hose 400. Thus, the first section 402 of the hose 400 is sandwiched between the neck 126 and the internal face 142 of the clip 140. Moreover, a second section (404) of the expansible hose 400 is sandwiched between the planar rear face (127) of the head 128 and a front end of the C-clip 140.

The thread 164 is engaged with the thread 124 to connect the first ring 160 to the cylinder 120. Thus, a third section 406 of the expansible hose 400 is sandwiched between the front face 129 of the head 128 and the frusto-conical face 166.

The match of the frusto-conical external face of the neck 126 with the frusto-conical internal face 142 of the C-clip 140 and the match of the frusto-conical external face 144 of the C-clip 140 with the first frusto-conical face 165 of the first ring 160 squeeze the first section 402 of the expansible hose 400 tighter between the neck 126 and the C-clip 140 as the thread 164 is tighter engaged with the thread 124. The match of the frusto-conical front face 129 of the head 128 with the second frusto-conical face 166 of the first ring 160 squeezes the third section 406 of the expansible hose 400

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tighter between the head **128** and the first ring **160** as the thread **164** is tighter engaged with the thread **124**.

Finally, the thread **182** is engaged with the thread **162** to connect the second ring **180** to the first ring **160**.

Referring to FIG. 4, the expansible hose **400** is expanded 5 by water that runs therein. The thickness of the expansible hose **400** is reduced as the length and diameter of the expansible hose **400** are increased. This reduction however does not render the expansible hose **400** slack in the joint **100** for reasons. At first, before the expansible hose **400** is expanded, the thickness of the first section **402** of the 10 expansible hose **400** is reduced since the first section **402** of the expansible hose **400** is pressed tight between the neck **126** and the C-clip **140** as mentioned above. Secondly, before the expansible hose **400** is expanded, the thickness of 15 the third section **406** of the expansible hose **400** is reduced since the third section **406** of the expansible hose **400** is pressed tight between the head **128** and the first ring **160** as mentioned above. Thirdly, a fold between the first and second sections **402** and **404** of the expansible hose **400** is 20 stuck between the nozzle **121** and the C-clip **140**. Fourthly, a fourth section **408** of the expansible hose **400** is pressed tighter against the frusto-conical face **184** of the second ring **180** as the expansible hose **400** is expanded more. Hence, the expansible hose **400** is firmly connected to the joint **100** and 25 there is no leak.

The first and second rings **160** and **180** are made as two individual elements as they are made by mold-injection of plastics in the preferred embodiment. The first and second rings **160** and **180** can however be made in one piece if they 30 are made of metal in another embodiment.

The present invention has been described via the detailed illustration of the preferred embodiment. Those skilled in the art can derive variations from the preferred embodiment without departing from the scope of the present invention. 35 Therefore, the preferred embodiment shall not limit the scope of the present invention defined in the claims.

The invention claimed is:

1. A joint (**100**) for an expansible hose (**400**), the joint (**100**) including: 40

a cylinder (**120**) formed with a thread (**124**) and a nozzle (**121**), wherein the nozzle (**121**) is formed with a neck (**126**) and a head (**128**), and wherein the head (**128**) is formed with a rear face (**127**) and a front face (**129**);

a C-clip (**140**) formed with a front end and placed on a 45 first section (**402**) of the expansible hose (**400**) so that the first section (**402**) of the expansible hose (**400**) is

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pressed on the neck (**126**) and that a second section (**404**) of the expansible hose (**400**) is placed between the front end of the C-clip (**140**) and the rear face (**127**) of the head (**128**) and that a fold between the first and second sections (**402/404**) of the expansible hose (**400**) is stuck between the nozzle (**121**) and the C-clip (**140**); a first ring (**160**) including a thread (**164**) engaged with the thread (**124**) of the cylinder (**120**) and a first frusto-conical face (**165**) in contact with the C-clip **140** so that the first section (**402**) of the expansible hose (**400**) is sandwiched between the C-clip (**140**) and the neck (**126**); and

a second ring (**180**) connected to the first ring (**160**) and formed with a frusto-conical internal face (**184**) that cooperates with an end of the first ring (**160**) to provide a tapered annular space to allow water to expand and press a fourth section (**408**) of the expansible hose (**400**) against the frusto-conical internal face (**184**) of the second ring (**180**) so that the frusto-conical internal face (**184**) of the second ring (**180**) exerts an axial net force on the fourth section (**408**) of the expansible hose (**400**) toward the first ring (**160**).

2. The joint according to claim 1, wherein the first ring (**160**) includes a second frusto-conical face (**166**) in contact with a third section (**406**) of the expansible hose (**400**) so that the third section of the expansible hose (**400**) is pressed on the front face (**129**) of the head (**128**).

3. The joint according to claim 2, wherein the neck (**126**) includes a frusto-conical external face in contact with the first section (**402**) of the expansible hose (**400**), and wherein the C-clip (**140**) includes a frusto-conical internal face (**142**) in contact with the first section (**402**) of the expansible hose (**400**).

4. The joint according to claim 3, wherein the rear face (**127**) of the head (**128**) is a planar face so that there is a sharp angle between the planar rear face (**127**) of the head (**128**) and the frusto-conical external face of the neck (**126**).

5. The joint according to claim 4, wherein the front face (**129**) of the head (**128**) is a frusto-conical face for contact with the third section (**406**) of the expansible hose (**400**).

6. The joint according to claim 1, wherein the first and second rings (**160/180**) are made two individual elements.

7. The joint according to claim 6, wherein the first ring (**160**) is formed with a thread (**162**), and wherein the second ring (**180**) includes a thread (**182**) engaged with the thread (**162**) of the first ring (**160**).

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